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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,301	12/30/2003	Xing Su	21058/0206690-US0	1668
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Intel Corporation c/o DARBY & DARBY P.C. P.O. BOX 770 CHURCH STREET STATION NEW YORK, NY 10008-0770			EXAMINER YU, MELANIE J	
			ART UNIT 1641	PAPER NUMBER
			MAIL DATE 12/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/750,301	Applicant(s) SU ET AL.	
	Examiner Melanie Yu	Art Unit 1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12,33,34 and 94 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12,33,34 and 94 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's amendment filed 4 October 2007 has been entered.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-12, 33, 35 and 94 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant's amendment to claims 1 and 33 recites a "hydrated" gel, which is not provided for in the instant specification and is new matter. It is noted that instant specification, at paragraph 43, describes a sponge like gel and agarose and polyacrylamide gels containing up to 99.5% water, but do not state that the gel is **hydrated**. Applicant does not define a gel having up to 99.5% water as being hydrated. Applicant's specification describing a polyacrylamide or agarose gel and a gel having up to 99.5% water does not provide sufficient support for a hydrated gel as recited in claims 1 and 33.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 1, 2, 5, 10, 33 and 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US 6,699,724) in view of Renn et al. (US 3,875,044).

West et al. teach a gel matrix comprising a hydrated gel (alginate, col. 3, lines 48-52; col. 14, lines 49-53) comprising pores having a size to sieve molecules of a desired range (sample with molecules to be detected are incubated in the gel with the nanoparticles, therefore the hydrogel matrix must have a pore size large enough to permit movement of molecules, col. 15, lines 6-11; col. 16, lines 20-24) and one or more SERS-enhancing nanoparticles (core diameters start at 1nm and shell thickness starts at 1nm, which means the particle size starts at 3nm, col. 8, lines 23-26; nanoparticles are SERS-enhancing, col. 8, lines 3, lines 63-66; col. 10, lines 64-66) stationary within the gel (nanoshells are embedded to prevent migration, col. 12, lines 56-59). West et al. fail to teach the hydrated gel capable of moving the molecules by electrophoresis or magnetophoresis.

Renn et al. teach that a hydrated gel of alginate, agarose or polyacrylamide gel may be used for electrophoresis, in order to provide a hydrated gel sheet for molecular diffusion processes.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include as the gel of West et al., an agarose or polyacrylamide gel as taught by Renn et al. One having ordinary skill in the art would have

been motivated to make such a change as a mere alternative and functionally equivalent hydrogel and since the same gelling and matrix support effect would have been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components.

With respect to claims 2 and 5, West et al. teach a plurality of nanoparticles to provide a plurality of unique optical signatures (different signals are detected to differentiate between analyte, col. 12, lines 21-28; different signals are controlled by shell thickness, col. 3, lines 18-27).

Regarding claims 10 and 94, West et al. teach a probe attached to the nanoparticles being oligonucleotides, antigens or antibodies (col. 3, lines 51-57) that bind specifically to an analyte (col. 4, lines 42-45).

With respect to claim 33, West et al. teach a system comprising the gel matrix of claim 1, a sample containing at least one analyte (col. 4, lines 64-67); and an optical detection system suitable for detecting SERS signals from the nanoparticles (col. 7, lines 2-6).

3. Claims 3, 4 and 7-9, 11, 12 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US 6,699,724) in view of Renn et al. (US 3,875,044), as applied to claim 1, further in view of Schultz et al. (US 6,180,415).

West et al. in view of Renn et al. teach a gel matrix comprising embedded SERS-enhancing nanoparticles, but fail to teach the nanoparticles having Raman-active tags or the nanoparticles having a net charge.

Schultz et al. teach SERS-enhancing nanoparticles comprising one or more Raman active tags of fluorescent dyes and nucleic acids (col. 3, lines 42-48), at least one of the nanoparticles having a net charge (col. 30, lines 55-57) and a computer comprising an

algorithm for analysis of the SERS signals obtained from the sample (col. 15, line 66-col. 16, line 4), in order to provide a Raman signal with increased enhancement.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the matrix of West et al. in view of Renn et al., in order to provide a Raman signal with improved sensitivity and more accurately detects the presence of analyte.

Regarding claims 7-9, 11 and 12, Schultz et al. teach nanoparticles being composite organic-inorganic nanoparticles comprising a core and a surface, wherein the core comprises a metallic colloid comprising a first metal and a Raman active organic compound (col. 24, lines 44-50; col. 23, lines 35-48). Schultz et al. teach the COINs further comprising a second metal different from the first metal forming a layer overlying the surface of the nanoparticles (silver shell and gold core, col. 23, lines 35-39) and further comprising an organic layer overlying the metal layer, which comprises a polynucleotide probe (col. 23, lines 40-48 and 54-61; col. 5, lines 60-67). Schultz et al. further teach at least some of the nanoparticles comprising a fluorescent label that contributes to the optical signature (col. 23, lines 40-48). The properties of the nanoparticles taught by Schultz et al. are provided for increased Raman signal enhancement.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the gel matrix of West et al. in view of Renn et al., nanoparticle properties described above as taught by Schultz et al., in order to provide a Raman signal with improved sensitivity and more accurately detects the presence of analyte.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US 6,699,724) in view of Renn et al. (US 3,875,044), as applied to claim 1, further in view of Mirkin et al. (US 2003/0211488).

West et al. in view of Renn et al. teach a gel matrix comprising nanoparticles, but fail to teach the Raman tag comprising adenine.

Mirkin et al. teach a Raman-active tag being an analog of adenine, poly-adenine (par. 181), in order to utilize a spectroscopic fingerprint in protein-protein screening.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the solid gel matrix of West et al. in view of Renn et al., nanoparticles comprising a Raman-active tag of an analog of adenine as taught by Mirkin et al., in order to provide increased sensitivity and specificity of detection of analyte.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-12, 33, 34 and 94 have been considered but are moot in view of the new ground(s) of rejection. Previous rejections of the claims have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of applicant's amendment requiring a hydrated gel.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Melanie Yu  
Patent Examiner  
Art Unit 1641



LONG V. LE 12/21/07  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1600